SEQUENCE LISTING

(1) GENERAL INFORMATION:

    (i) APPLICANT: Murphy, Brian R.
                Collins, Peter L.
                Whitehead, Stephen S.
                Bukreyev, Alexander A.
                Juhasz, Katalin

    (ii) TITLE OF INVENTION: PRODUCTION OF ATTENUATED RESPIRATORY
          SYNCYTIAL VIRUS VACCINES FROM CLONED NUCLEOTIDE SEQUENCES

    (iii) NUMBER OF SEQUENCES: 14

    (iv) CORRESPONDENCE ADDRESS:
        (A) ADDRESSEE: Townsend and Townsend and Crew LLP
        (B) STREET: Two Embarcadero Center, 8th Floor
        (C) CITY: San Francisco
        (D) STATE: CA
        (E) COUNTRY: USA
        (F) ZIP: 94111-3834

    (v) COMPUTER READABLE FORM:
        (A) MEDIUM TYPE: Floppy disk
        (B) COMPUTER: IBM PC compatible
        (C) OPERATING SYSTEM: PC-DOS/MS-DOS
        (D) SOFTWARE: PatentIn Release #1.0, Version #1.25

    (vi) CURRENT APPLICATION DATA:
        (A) APPLICATION NUMBER: US
        (B) FILING DATE: 15-JUL-1997
        (C) CLASSIFICATION:

    (vii) PRIOR APPLICATION DATA:
        (A) APPLICATION NUMBER: US 60/047,634
        (B) FILING DATE: 23-MAY-1997

    (vii) PRIOR APPLICATION DATA:
        (A) APPLICATION NUMBER: US 60/046,141
        (B) FILING DATE: 09-MAY-1997

    (vii) PRIOR APPLICATION DATA:
        (A) APPLICATION NUMBER: US 60/021,773
        (B) FILING DATE: 15-JUL-1996

    (viii) ATTORNEY/AGENT INFORMATION:
        (A) NAME: Parmelee, Steven W.
        (B) REGISTRATION NUMBER: 31,990
        (C) REFERENCE/DOCKET NUMBER: 17634-000510

    (ix) TELECOMMUNICATION INFORMATION:
        (A) TELEPHONE: 206-467-9600
        (B) TELEFAX: 415-576-0300

(2) INFORMATION FOR SEQ ID NO:1:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 15223 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

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TGATACTATC AAGAACCAAA AATTTCATCA TGCCTAAGAA AGCTGATAAA GAGTCTATTG    14640
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AACTAAATTA CGAGATATTA GTTTTTGACA CTTTTTTTCT CGT                     15223
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(2) INFORMATION FOR SEQ ID NO:2:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 15225 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

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TGATAAAGGT TAGATTACAA AATTTATTTG ACAATGACGA AGTAGCATTG TTAAAAATAA    180

CATGTTATAC TGACAAATTA ATTCTTCTGA CCAATGCATT AGCCAAAGCA GCAATACATA    240

CAATTAAATT AAACGGTATA GTTTTTATAC ATGTTATAAC AAGCAGTGAA GTGTGCCCTG    300

ATAACAACAT TGTAGTAAAA TCTAACTTTA CAACAATGCC AATATTACAA AACGGAGGAT    360

ACATATGGGA ATTGATTGAG TTGACACACT GCTCTCAATT AAACGGTCTA ATGGATGATA    420

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CCCAACCAAA CCAAGCTATT CCTCAAACAA CAATGCTCAA TAGTTAAGAA GGAGCTAATC   1080
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AACAATCAAC TTTGCAAATC CATCTGTAAA ACAATACCAA GCAACAAACC AAAGAAGAAA    5280
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ACATTCGATA AAAATCCCAA TGCCGAGTTT GTAACATTGA TGAGGGATCC ACAGGCGTTA    11700

GGGTCTGAAA GGCAAGCTAA AATTACTAGT GAGATTAATA GATTAGCAGT AACAGAAGTC    11760

TTAAGTATAG CTCCAAACAA AATATTTTCT AAAAGTGCAC AACATTATAC TACCACTGAG    11820

ATTGATCTAA ATGACATTAT GCAAAATATA GAACCAACTT ACCCTCATGG ATTAAGAGTT    11880

GTTTATGAAA GTCTACCTTT TTATAAAGCA GAAAAAATAG TTAATCTTAT ATCAGGAACA    11940

AAATCCATAA CTAATATACT TGAAAAAACA TCAGCAATAG ATACAACTGA TATTAATAGG    12000

GCTACTGATA TGATGAGGAA AAATATAACT TTACTTATAA GGATACTTCC ACTAGATTGT    12060

AACAAAGACA AAAGAGAGTT ATTAAGTTTA GAAAATCTTA GTATAACTGA ATTAAGCAAG    12120

TATGTAAGAG AAAGATCTTG GTCATTATCC AATATAGTAG GAGTAACATC GCCAAGTATT    12180

ATGTTCACAA TGGACATTAA ATATACAACT AGCACTATAG CCAGTGGTAT AATTATAGAA    12240

AAATATAATG TTAATAGTTT AACTCGTGGT GAAAGAGGAC CTACTAAGCC ATGGGTAGGT    12300

TCATCTACGC AGGAGAAAAA AACAATGCCA GTGTACAATA GACAAGTTTT AACCAAAAAG    12360

CAAAGAGACC AAATAGATTT ATTAGCAAAA TTAGACTGGG TATATGCATC CATAGACAAC    12420

AAAGATGAAT TCATGGAAGA ACTGAGTACT GGAACACTTG GACTGTCATA TGAAAAAGCC    12480

AAAAAGTTGT TTCCACAATA TCTAAGTGTC AATTATTTAC ACCGTTTAAC AGTCAGTAGT    12540

AGACCATGTG AATTCCCTGC ATCAATACCA GCTTATAGAA CAACAAATTA TCATTTCGAT    12600

ACTAGTCCTA TCAATCATGT ATTAACAGAA AAGTATGGAG ATGAAGATAT CGACATTGTG    12660

TTTCAAAATT GCATAAGTTT TGGTCTTAGC CTGATGTCGG TTGTGGAACA ATTCACAAAC    12720

ATATGTCCTA ATAGAATTAT TCTCATACCG AAGCTGAATG AGATACATTT GATGAAACCT    12780

CCTATATTTA CAGGAGATGT TGATATCATC AAGTTGAAGC AAGTGATACA AAAACAGCAT    12840

ATGTTCCTAC CAGATAAAAT AAGTTTAACC CAATATGTAG AATTATTCCT AAGTAACAAA    12900

GCACTTAAAT CTGGATCTAA CATCAATTCT AATTTAATAT TAGTACATAA AATGTCTGAT    12960

TATTTTCATA ATGCTTATAT TTTAAGTACT AATTTAGCTG ACATTGGAT TCTAATTATT    13020

CAACTTATGA AAGATTCAAA AGGTATTTTT GAAAAAGATT GGGGAGAGGG GTACATAACT    13080

GATCATATGT TCATTAATTT GAATGTTTTC TTTAATGCTT ATAAGACTTA TTTGCTATGT    13140

TTTCATAAAG GTTATGGTAA AGCAAAATTA GAATGTGATA TGAACACTTC AGATCTTCTT    13200

TGTGTTTTGG AGTTAATAGA CAGTAGCTAC TGGAAATCTA TGTCTAAAGT TTTCCTAGAA    13260

CAAAAAGTCA TAAAATACAT AGTCAATCAA GACACAAGTT TGCATAGAAT AAAAGGCTGT    13320

CACAGTTTTA AGTTGTGGTT TTTAAAACGC CTTAATAATG CTAAATTTAC CGTATGCCCT    13380

TGGGTTGTTA ACATAGATTA TCACCCAACA CATATGAAAG CTATATTATC TTACATAGAT    13440

TTAGTTAGAA TGGGGTTAAT AAATGTAGAT AAATTAACCA TTAAAAATAA AAACAAATTC    13500

AATGATGAAT TTTACACATC AAATCTCTTT TACATTAGTT ATAACTTTTC AGACAACACT    13560

CATTTGCTAA CAAAACAAAT AAGAATTGCT AATTCAGAAT TAGAAGATAA TTATAACAAA    13620

CTATATCACC CAACCCCAGA AACTTTAGAA AATATATCAT TAATTCCTGT TAAAAGTAAT    13680
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AATAGTAACA AACCTAAATT TTGTATAAGT GGAAATACCG AATCTATAAT GATGTCAACA    13740

TTCTCTAATA AAATGCATAT TAAATCTTCC ACTGTTACCA CAAGATTCAA TTATAGCAAA    13800

CAAGACTTGT ACAATTTATT TCCAAATGTT GTGATAGACA GGATTATAGA TCATTCAGGT    13860

AATACAGCAA AATCTAACCA ACTTTACATC ACCACTTCAC ATCAGACATC TTTAGTAAGG    13920

AATAGTGCAT CACTTTATTG CATGCTTCCT TGGCATCATG TCAATAGATT TAACTTTGTA    13980

TTTAGTTCCA CAGGATGCAA GATCAGTATA GAGTATATTT TAAAAGATCT TAAGATTAAG    14040

GACCCCAGTT GTATAGCATT CATAGGTGAA GGAGCTGGTA ACTTATTATT ACGTACGGTA    14100

GTAGAACTTC ATCCAGACAT AAGATACATT TACAGAAGTT TAAAAGATTG CAATGATCAT    14160

AGTTTACCTA TTGAATTTCT AAGATTATAC AACGGGCATA TAAACATAGA TTATGGTGAG    14220

AATTTAACCA TTCCTGCTAC AGATGCAACT AATAACATTC ATTGGTCTTA TTTACATATA    14280

AAATTTGCAG AACCTATTAG CATCTTTGTC TGCGATGCTG AATTACCTGT TACAGCCAAT    14340

TGGAGTAAAA TTATAATTGA ATGGAGTAAG CATGTAAGAA AGTGCAAGTA CTGTTCTTCT    14400

GTAAATAGAT GCATTTTAAT CGCAAAATAT CATGCTCAAG ATGATATTGA TTTCAAATTA    14460

GATAACATTA CTATATTAAA AACTTACGTG TGCCTAGGTA GCAAGTTAAA AGGATCTGAA    14520

GTTTACTTAG TCCTTACAAT AGGCCCTGCA AATATACTTC CTGTTTTTGA TGTTGTGCAA    14580

AATGCTAAAT TGATTTTTTC AAGAACTAAA AATTTCATTA TGCCTAAAAA AACTGACAAG    14640

GAATCTATCG ATGCAAATAT TAAAAGCTTA ATACCTTTCC TTTGTTACCC TATAACAAAA    14700

AAAGGAATTA AGACTTCATT GTCAAAATTG AAGAGTGTAG TTAATGGGGA TATATTATCA    14760

TATTCTATAG CTGGACGTAA TGAAGTATTC AGCAACAAGC TTATAAACCA CAAGCATATG    14820

AATATCCTAA AATGGCTAGA TCATGTTTTA AATTTTAGAT CAGCTGAACT TAATTACAAT    14880

CATTTATACA TGATAGAGTC CACATATCCT TACTTAAGTG AATTGTTAAA TAGTTTAACA    14940

ACCAATGAGC TCAAGAAACT GATTAAAATA ACAGGTAGTG TACTATACAA CCTTCCCAAC    15000

GAACAGTAAC TTAAAATATC ATTAACAAGT TTGGTCAAAT TTAGATGCTA ACACATCATT    15060

ATATTATAGT TATTAAAAAA TATGCAAACT TTTCAATAAT TTAGCTTACT GATTCCAAAA    15120

TTATCATTTT ATTTTTAAGG GGTTGAATAA AAGTCTAAAA CTAACAATGA TACATGTGCA    15180

TTTACAACAC AACGAGACAT TAGTTTTTGA CACTTTTTTT CTCGT                     15225
```

(2) INFORMATION FOR SEQ ID NO:3:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 33 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

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ACTCAAATAA GTTAATAAAA AATATCCCGG GAT                                     33
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(2) INFORMATION FOR SEQ ID NO:4:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 31 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

CCCGGGATAT TTTTTATTAA CTTATTTGAG T   31

(2) INFORMATION FOR SEQ ID NO:5:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 18 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

GAAAGTATAT ATTATGTT   18

(2) INFORMATION FOR SEQ ID NO:6:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 20 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

TATATAAGCA CGATGATATG   20

(2) INFORMATION FOR SEQ ID NO:7:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 16 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

ACTCAAATAA GTTAAT   16

(2) INFORMATION FOR SEQ ID NO:8:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 14 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

TAACTTATTT GAGT   14

(2) INFORMATION FOR SEQ ID NO:9:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 28 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

GACACAACCC ACAATGATAA TACACCAC   28

(2) INFORMATION FOR SEQ ID NO:10:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 32 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

CATCTCTAAC CAAGGGAGTT AAATTTAAGT GG   32

(2) INFORMATION FOR SEQ ID NO:11:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 27 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

TTAAGGAGAG ATATAAGATA GAAGATG   27

(2) INFORMATION FOR SEQ ID NO:12:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 27 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

GTTTTATATT AACTAATGGT GTTAGTG   27

(2) INFORMATION FOR SEQ ID NO:13:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 33 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

TTATAATTGC AGCCATCATA TTCATAGCCT CGG   33

(2) INFORMATION FOR SEQ ID NO:14:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 30 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: cDNA

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

GTGAAGTTGA GATTACAATT GCCAGAATGG   30